REVISIONS

LT	DESCRIPTION	DATE	APPROVED
A	Added additional packaging requirements. Added another suggested source of supply..	4 JUN 90	D. Moore
B	Pg. 2: Deleted requirements for thermal shock/immersion and moisture resistance tests. Pg. 4: Changed dimension across teeth of lockwasher to .032 inch ± .005 inch. Pg. 5: Added application note in 6.2. Pg. 6: Added "user of record" paragraph. Corrected supplier's part numbers on -002, -003, and -010. Editorial changes throughout.	5 APR 93	D. Moore
C	Pg. 2: Added gold case finish option; prohibited pure tin case finish. Pg. 3: Changed sample requirements for dc resistance/dc voltage drop test. Pg. 5: Added paragraph to explain pure tin prohibition. Editorial changes throughout.	29 MAR 94	D. Moore
D	Table I, dash number 007; changed 1 Ghz IL value	24 SEP 96	D. Moore
E	Table I, insertion loss changes; added column for IL at resonant frequency and new footnote.	24 FEB 98	D. Moore
F	Pg. 2: Para 3.1.3; Removed MIL-T-10727 reference. Pg. 7: Removed a source of supply. Editorial changes.	27 APR 01	Kendall A. Cottongim

PREVIOUS CAGE CODE 14933 SUPERSEDED BY 037Z3

THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.

Prepared in accordance with MIL-STD-100 — Selected item drawing

REV STATUS OF PAGES																		
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PMIC N/A	**PREPARED BY** PATRICK G. KYNE	**DEFENSE SUPPLY CENTER COLUMBUS** **COLUMBUS, OH**
Original date of drawing 16 November 1988	**CHECKED BY** DAVID E. MOORE	**TITLE** **FILTERS AND CAPACITORS, RADIO FREQUENCY/ ELECTROMAGNETIC INTERFERENCE SUPPRESSION, NONHERMETICALLY SEALED**
	APPROVED BY DAVID E. MOORE	
	SIZE A / **CODE IDENT. NO.** 14933	**DWG NO.** **88051**
	REV F	**PAGE** 1 **OF** 7

AMSC N/A

59GP-E047

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing and MIL-PRF-28861 describe the complete requirements for radio frequency interference filters and capacitors.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:

88051 -	XXX	X
Drawing number	Dash number (see table I)	Case finish (see 3.1.3)

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.5).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-28861 - Filters and Capacitors, Radio Frequency/Electromagnetic, Interference, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-220 - Method of Insertion Loss Measurement.
MIL-STD-1285 - Marking of Electrical and Electronic Parts.

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Document Automation and Production Service, Bldg 4D (DPM-DoDSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094).

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-28861 and herein.

3.1.1 Terminals. Terminals shall be solderable and in accordance with figure 1 herein.

3.1.2 Case dimensions. The case dimensions shall be in accordance with figure 1 herein.

3.1.3 Finish. The finish shall be T (tin plated or tin-lead plated), S(silver plated), or G(gold plated); in accordance with MIL-PRF-28861. (NOTE: Pure tin finish is prohibited after 30 September 1994 (see 6.3)).

3.3 Temperature rise. The temperature rise shall be +25°C maximum.

3.4 Thermal shock and immersion (group B). Not applicable.

3.5 Moisture resistance. Not applicable.

3.6 Seal. Not applicable.

3.7 Solderability of terminals. In accordance with MIL-PRF-28861.

3.8 Electrical characteristics.

3.8.1 Rated voltage. The rated voltage shall be in accordance with table I.

3.8.2 Rated current. The rated current shall be 10 amperes maximum.

3.8.3 Capacitance. Capacitance shall be in accordance with table I.

3.8.4 Dissipation factor. 3 percent maximum.

3.8.5 Voltage and temperature limits of capacitance. Voltage and temperature limits of capacitance shall be +15, -40 percent.

3.8.6 Insulation resistance. Insulation resistance shall be as follows:

At +25°C: 1,000 megohm-microfarads or 100,000 megohms minimum, whichever is less.
At +125°C: 100 megohm-microfarads or 10,000 megohms minimum, whichever is less.

3.8.7 Insertion loss. Insertion loss shall be as follows:

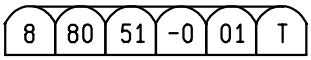
At +25° C: In accordance with table I.
At -55° C and +125° C: A 3 dB degradation from the +25°C value shall be allowed.

3.8.8 Voltage drop. Voltage drop shall be 0.2 volt, maximum.

3.8.9 DC resistance. DC resistance shall be 0.02 ohm, maximum.

3.9 Product assurance level. Class B only.

3.10 Marking. Filters shall be marked, as a minimum, with the PIN as shown in the example. The unit package shall be marked in accordance with MIL-STD-1285, except the PIN shall be as specified in 1.2, with the manufacturer's name or code, date code, voltage rating, and current rating.



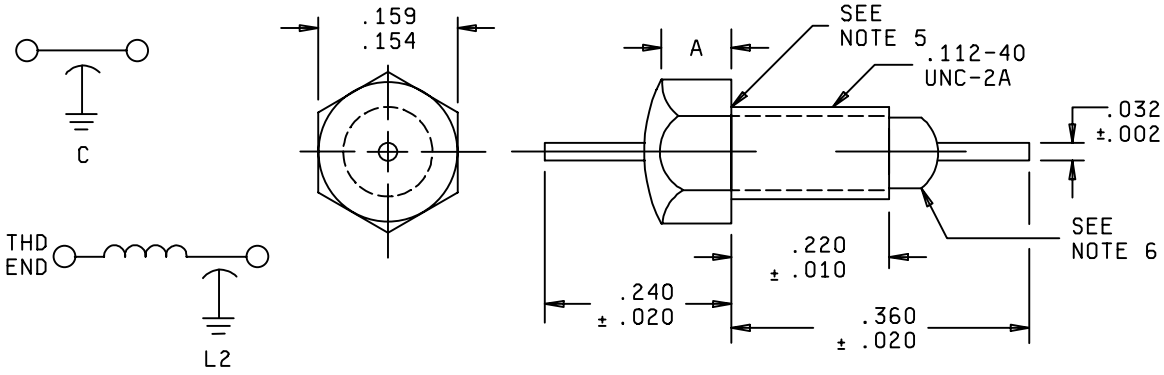
Example of marking for the PIN
on the hex flats - expanded view

3.11 Manufacturer eligibility. To be eligible for listing as a suggested source of supply, a manufacturer shall be listed on the MIL-PRF-28861 Qualified Products List for at least one part or, perform first article inspection in accordance with the MIL-PRF-28861 qualification inspection requirements for class B.

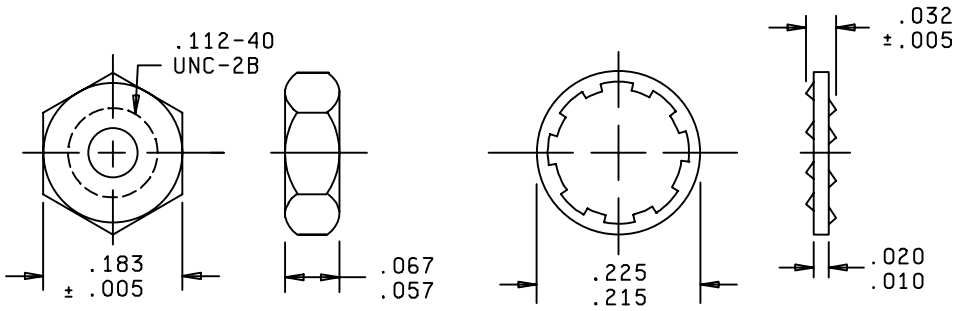
3.12 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be a suggested source of supply.

3.13 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.13 Workmanship. Filters shall be processed in such a manner as to be uniform in quality and shall be free from cold soldering, corrosion, pits, dents, cracks, rough sharp edges, misalignments, and other defects that will affect life, serviceability, or appearance. Cracks in glass seals are not allowed, however, minor meniscus crazing is acceptable.



CIRCUIT DIAGRAMS



HEX NUT

LOCKWASHER

Inches	mm	Inches	mm
.002	0.05	.120	3.05
.005	0.13	.145	3.68
.007	0.18	.154	3.91
.010	0.25	.159	4.04
.020	0.51	.183	4.65
.030	0.76	.215	5.46
.032	0.81	.220	5.59
.057	1.45	.225	5.72
.067	1.70	.240	6.10
.112	2.84	.360	9.14

Dash number	A dimension
-003	.145 ±.030
-001, -002, -004 thru -010	.120 ±.005

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Circuit diagram is for information only.
4. All filters shall be supplied with mounting hardware (hex nut and lockwasher).
5. One and one-half imperfect threads allowed .030 inch (0.76 mm) maximum.
6. One imperfect thread allowed .030 inch (0.76 mm) maximum.
7. Recommended mounting torque: 32 oz-inch ±4 oz-inch.
8. Potting shall not extend beyond .030 inch (0.76 mm) from the filter body.

FIGURE 1. Case and hardware dimensions and circuit diagrams.

TABLE I. Electrical characteristics.

Dash Number	Circuit	Rated voltage volts dc	Capacitance (μF) -0, +100 percent	Minimum insertion loss (dB) in accordance with MIL-STD-220 1/ 2/						Minimum insertion loss at resonant frequency 3/
				1 Mhz	10 Mhz	100 Mhz	200 Mhz	1 Ghz	10 Ghz	
001	C	100	.027	10	30	39	43	65	70	40dB 200Mhz-1Ghz
002	L2	100	.027	10	30	50	45	65	70	--------
003	L2	100	.045	14	37	45	45	70	70	40 dB 100Mhz-500Mhz
004	C	200	10 pF	---	---	---	---	5	15	---------
005	C	200	100 pF	---	---	3	10	20	28	---------
006	C	200	500 pF	---	---	15	20	34	45	---------
007	C	200	1,000 pF	---	4	20	25	25	55	---------
008	C	200	5,000 pF	---	15	34	41	42	55	30dB 200Mhz-1Ghz
009	C	200	.01	4	21	35	42	50	70	35dB 200Mhz-1Ghz
010	L2	200	.01	4	21	35	44	50	70	35dB 200Mhz-1Ghz

1/ For C circuits, insertion loss measurements shall be made under no load. For L2 circuits, insertion loss measurements shall be made under full load over the frequency range of 1 Mhz to 10 Mhz. Insertion loss measurements above this frequency range shall be made under no load.

2/ Except as specified in 3/, the insertion loss requirements between any two adjacent specified frequencies shall be that of the lower of the two frequencies in order to accommodate resonant dips.

3/ The frequency range in which the resonant frequency dip will occur and the minimum insertion loss at the resonant frequency.

4. VERIFICATION

4.1 Qualification inspection. Qualification inspection is not required.

4.2 Conformance inspection.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A and B inspections of MIL-PRF-28861 for class B. (The dc resistance/dc voltage drop test shall be performed on a sample basis as specified in MIL-PRF-28861 group A inspection table.)

4.2.2 Certification. The acquiring activity, at its discretion, may accept a certification of compliance with group B requirements in lieu of performing group B tests (see 6.5c).

4.2.3 Inspection of packaging. Inspection of packaging shall be in accordance with MIL-PRF-28861.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.5). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory control Point's packaging activity within the Military Department or Defense agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended use. Filters conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-28861, this drawing becomes obsolete and will not be used for new design. The QPL-28861 product shall be the preferred item for all applications.

6.2 Application note. These nonhermetically sealed filters may be susceptible to moisture intrusion when subjected to repeated thermal cycling. If these items are to be utilized in applications enduring harsh environments, the user should consider placing them within hermetic enclosures.

6.3 Tin plated finish. Pure tin plating is prohibited since it may result in tin whisker growth. Tin whisker growth could adversely affect the operation of electronic equipment systems. For additional information on this matter, refer to ASTM B545 (Standard Specification for Electrodeposited Coating of Tin).

6.4 Cataloging information. Dash numbers 001 and 004 through 009 shall be cataloged under FSC 5910 as feed through ceramic capacitors. Dash numbers 002, 003, and 010 shall be cataloged under FSC 5915 as radio frequency interference filters.

6.5 Ordering data. The contract or purchase order should specify the following:

a. Complete PIN (see 1.2).

b. Requirements for delivery and one copy of the quality conformance inspection data or certificate of compliance that parts have passed quality conformance inspection with each shipment of parts by the manufacturer.

c. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements.

d. Requirements for notification of change of product to acquiring activity, if applicable.

e. Requirements for packaging and packing.

6.6 Replaceability. Filters covered by this drawing will replace the same commercial device covered by contractor-prepared specification or drawing.

6.7 Users of record. Coordination of this document for future revisions is coordinated only with the suggested sources of supply and the users of record of this document. Requests to be added as a recorded user of this drawing should be in writing to DSCC-VAT, Post Office Box 3990, Columbus, OH 43216-5000 or by telephone (614) 692-0562 or DSN 850-0562.

6.8 Suggested sources of supply. Suggested sources of supply are listed herein. Additional sources will be added as they become available. For assistance in the use of this drawing, contact DSCC-VAT, Post Office Box 3990, Columbus, OH 43216-5000, or telephone (614) 692-0562.

DSCC drawing PIN 88051-	Vendor similar designation or type number 1/	Vendor CAGE	Vendor similar designation or type number 1/	Vendor CAGE
001	SA1A3-273E	59942	2126-2225-300B	66230
002	SA2A3-273AC	59942	2226-2225-300B	66230
003	SA2A3-453C	59942	2226-2225-301B	66230
004	SA1B3-100H	59942	2136-2225-300B	66230
005	SA1B3-101D	59942	2136-2225-301B	66230
006	SA1B3-501E	59942	2136-2225-302B	66230
007	SA1B3-102B	59942	2136-2225-303B	66230
008	SA1B3-502B	59942	2136-2225-304B	66230
009	SA1B3-103A	59942	2136-2225-305B	66230
010	SA2B3-103B	59942	2236-2225-300B	66230

1/ CAUTION: Do not use this number for item acquisition and marking. The similar vendor type may not satisfy the requirements of this drawing.

Vendor CAGE	Vendor name and address
59942	AVX Filters Corporation 11144 Penrose Street Unit 5 Sun Valley, CA 91352-2756
66230	Pacific Aerospace & Electronics, Inc 434 Olds Station Road Wenatchee, WA 98801-5975